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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,829	08/28/2003	Wataru Taki	2936-0194P	6644
2292	7590	03/13/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				ARANDA, REY
		ART UNIT		PAPER NUMBER
				2816

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/649,829	TAKI ET AL.	
	Examiner Rey J. Aranda	Art Unit 2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 January 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 4-7 and 11-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 4-6, 11-13, 15 and 17 is/are rejected.
- 7) Claim(s) 7, 14, 16 and 18 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 28 August 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicants' amendment filed on January 17, 2006 has been received and entered in the case. Claims 4-7 and 11-18 are pending. The amendments and arguments do not overcome the prior art rejections noted in the previous Office action, and therefore, are remained for the reason set forth below. This action is FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-6, 11-13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,112,070 issued to Katsuyama et al. in view of Humphries et al. (Industrial electronics, Breton Publishers, 1983, chapter 2, page 38) and further view of the applicants' admitted prior art.

As per claim 4, Katsuyama discloses a frequency conversion apparatus (fig. 1), comprising:

a filter (BPF 2A) having a fixed cut-off frequency for restricting a band of a reception signal (filter BPF 2A is fixed, the recited functional limitation is merely the function of a typical filter, BPF 2A receives the reception signal from the antenna ANT 1) so as to selectively pass only a first frequency band component;

an amplifier (LNA 3) for amplifying the reception signal having passed through the filter;

a variable filter (variable BPF 4) having a variable cut-off frequency for further restricting the band of the reception signal having been amplified by the amplifier (as shown, the BPF 4 receives the signal from the amplifier LNA 3), so as to cut off at least part of the first frequency band component and thereby to selectively pass only a second frequency band component (this is merely the function of a filter); and

a mixer (MIX 5) for mixing the reception signal having passed through the variable filter with a local oscillator signal (the signal is generated by the VCO 8),

wherein the cut-off frequency of the variable filter being controlled to vary according to a reception channel signal (the selected channel).

Further, Katsuyama explicitly discloses that the variable filter is a variable bandpass filter (BPF 4) which functions as combination functions of a variable lowpass filter and a variable highpass filter serially connected.

Katsuyama does not explicitly disclose (1) the variable filter is built by serially connecting together a variable low-pass filter for selectively passing only a low band component of a signal inputted thereto and a variable high-pass filter for selectively passing only a high band component of a signal inputted thereto, and (2) the amplifier is further used for isolating in addition to amplifying so as to the amplifier cuts off reflected waves that fall outside a pass band of the variable filter as called for the claim.

Humphries explicitly disclose a bandpass filter is merely a combination of a lowpass filter and a high pass filter cascaded (pg. 38, col. 1). In other words, a variable bandpass filter is art recognized equivalent with a variable lowpass filter and a variable highpass filter serially connected.

It would have been obvious to one skilled in the art at the time the invention was made to implement the variable bandpass of Katsuyama by serially connecting together a variable lowpass filter and a variable highpass filter. The motivation and/or suggestion would be to allow the user more control of the frequency band of the spectrum by independently controlling the variable lowpass filter and the variable highpass filter.

The applicants' admitted prior art explicitly discloses that a person skilled in the art should be aware of the reflection of unwanted signals that may leak back to the input terminal of the circuit and the need to produce a buffered signal coming out of the amplifier. As a solution to this problem, a combination of an amplification and isolation amplifier can be inserted between the mixer and the input terminal, which is also well known by a person skilled in the art (fig. 10A and paragraphs 5 and 6 of the present invention).

It would have been obvious to one skilled in the art at the time the invention was made to replace the amplifier (LNA 3) of Katsuyama by a combination of an amplification and isolation amplifier as taught by the applicants' admitted prior art. The motivation and/or suggestion would have been to isolate the input from the output to prevent the leaking of unwanted signals and to buffer the output signal of the amplifier.

As per claim 5, Katsuyama discloses a frequency conversion apparatus, which comprises a frequency conversion apparatus, which comprises elements and structure discussed in claim 4 herein above wherein the variable filter is a bandpass filter (BPF 4). Also discussed in claim 4, the bandpass filter is built using a variable lowpass filter

and a variable highpass filter serially connected. Further, Katsuyama teaches the frequency conversion apparatus is used as a tuner in mobile communication (the title).

Katsuyama does not explicitly disclose that the variable filter is a highpass filter as called for in the claim.

However, as known by a person having an average skill in the art, when more channels are available, the frequency band of the variable bandpass filter must be made wider to accommodate more channels. When the frequency band is required to be much wider, the existence of a lowpass filter has little or no meaning. In this situation, eliminating the variable lowpass filter would result cost savings without severely affecting the performance of the tuner.

It would have been obvious to one skilled in the art at the time the invention was made to eliminate the variable lowpass filter in the frequency conversion apparatus discussed in claim 4. The motivation and/or suggestion would be to reduce the cost of the implementation.

As per claim 6, the recited limitation is shown in fig. 1, i.e., the PLL circuit 9 controls the variable filter BPF 4 through line 11 and the local oscillator VCO 8.

As per claims 11 and 12, these claims are merely methods to operate the circuits having the structures discussed in claims 4 and 5, respectively. Since the structures discussed in claims 4 and 5 are disclosed, the methods to operate are seen as obvious.

As per claims 12, 15 and 17, these claims are rejected for the same reasons noted in claim 6.

Response to Arguments

Applicant's arguments filed January 17, 2006 have been fully considered but they are not persuasive.

Regarding the argument that the applicants' prior art disclose an apparatus that includes a separate high-frequency amplifier 12 and a separate isolation amplifier A instead of a single device which acts both as an amplification and isolation amplifier.

The examiner notes that the combination of the high-frequency amplifier 12 and the isolation amplifier A can be considered as a single amplifier between the mixer and the input terminal, which performs both amplifying and isolating functions. This amplifying and isolating amplifier will then isolate the input from the output to prevent the leaking of unwanted signals and to buffer the output signal of the amplifier.

Allowable Subject Matter

Claims 7, 14, 16 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 would be allowable because the prior art of record fails to disclose or suggest the inclusion of a voltage synthesizing circuit, which is used to control the cut-off frequency of the variable filter using a plurality of predetermined voltages.

Claims 14, 16 and 18 would be allowable for the same reasons noted in claim 7.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rey J. Aranda whose telephone number is 571-272-8044. The examiner can normally be reached on Mon-Fri, 8:00am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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RJA
03/08/2006



Quan Tra
Primary Examiner